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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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David J. Vining

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02/25/2008

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EXAMINER

ROY, BAISAKHI

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

02/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/856,683	Applicant(s) VINING ET AL.	
	Examiner BAISAKHI ROY	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8-15,23,24,26-30,32-42,44-46,48-57,59-67 and 69-110 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-6, 8-15, 23, 24, 26-30, 32-42, 44-46, 48-57, 59-67, 69-110 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/13/07, 9/6/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 11/7/07 have been fully considered but they are not persuasive. With respect to the refinement means, Cline et al. teach means for refining the wireframe model by adjusting the coordinate positions of the vertices along a normal vector associated with each vertex to more accurately represent the region of interest (col. 5 lines 24-28 lines 56-60, col. 17 lines 10-34, claim 1). Cline et al. also teach grouping or labeling the vertices of the wireframe model into specific regions (col. 8 lines 20-48, col. 11 lines 33-68, col. 14 line 34 – col. 15 line 32). With respect to determining the position of a needle, King, Jr. discloses a method and apparatus for guiding the position and orientation of image or a probe such as a biopsy needle in three-dimensional space (col. 4 lines 23-25 lines 66-67), where three-dimensional display could be a wireframe model (col. 5 lines 21-28). The art of record therefore teaches a system for interactively displaying three dimensional images of internal surface structures and providing the user to select viewing angles and planes in an interactive manner. Therefore the previous rejection of record is maintained and repeated below.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-5, 9-15, 27-30, 32-42, 44, 60-65, 69-108, and 110 are rejected under 35 U.S.C. 102(b) as being anticipated by Cline et al. (4729098).

Cline et al. disclose a method and system including a computer implemented method for interactively displaying three-dimensional structures comprising the formation of a three-dimensional volume of data from a series of two-dimensional images representing a physical property associated with a three dimensional body (col. 5 lines 1-4), segmenting a region of interest from the volume of data based on selected values of the physical property representing the region of interest (col. 19 lines 33-38), producing a wireframe model of the segmented region of interest, the wireframe model comprising a plurality of vertices with each vertex having a coordinate position (col. 3 lines 15-59). Cline et al. also teach means for refining the wireframe model by adjusting the coordinate positions of the vertices along a normal vector associated with each vertex to more accurately represent the region of interest (col. 5 lines 24-28 lines 56-60, col. 17 lines 10-34, claim 1). Cline et al. further teach rendering the wireframe model in an interactive three-dimensional display, producing a virtual three-dimensional environment (col. 4 lines 60-63).

The reference also teaches grouping or labeling the vertices of the wireframe model into specific regions (col. 8 lines 20-48, col. 11 lines 33-68, col. 14 line 34 – col. 15 line 32). Cline et al. also teach analyzing specific abnormalities or defects (col. 19 lines 45-51) and rendering the wireframe model in an interactive three-dimensional display to indicate the regions having abnormal structure. The eight bit vector is employed to produce vector lists of approximating surfaces. A non-linear interpolation

operation is performed to more closely approximate the desired surface and to provide more accurate representations of vectors normal to the desired surface and the accurate representation of these normal directions provides mean for accurately representing shading information on a display screen. The vertex grouper comprises a curvature calculator for calculating a curvature at each of the vertices (col. 15 lines 33-46).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 6, 8, 66, 67, and 109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cline et al. in view of Natarajan (5517602).

Cline et al. disclose a method and system including a computer implemented method for interactively displaying three-dimensional structures comprising the formation of a three-dimensional volume of data from a series of two-dimensional images representing a physical property associated with a three dimensional body (col. 5 lines 1-4), segmenting a region of interest from the volume of data based on selected values of the physical property representing the region of interest (col. 19 lines 33-38), producing a wireframe model of the segmented region of interest, the wireframe model comprising a plurality of vertices with each vertex having a coordinate position (col. 3 lines 15-59). Cline et al. also teach means for refining the wireframe model by adjusting

the coordinate positions of the vertices along a normal vector associated with each vertex to more accurately represent the region of interest (col. 5 lines 24-28 lines 56-60, col. 17 lines 10-34, claim 1). Cline et al. further teach rendering the wireframe model in an interactive three-dimensional display, producing a virtual three-dimensional environment (col. 4 lines 60-63).

The reference also teaches grouping or labeling the vertices of the wireframe model into specific regions (col. 8 lines 20-48, col. 11 lines 33-68, col. 14 line 34 – col. 15 line 32). Cline et al. also teach analyzing specific abnormalities or defects (col. 19 lines 45-51) and rendering the wireframe model in an interactive three-dimensional display to indicate the regions having abnormal structure. The eight bit vector is employed to produce vector lists of approximating surfaces. A non-linear interpolation operation is performed to more closely approximate the desired surface and to provide more accurate representations of vectors normal to the desired surface and the accurate representation of these normal directions provides mean for accurately representing shading information on a display screen. The vertex grouper comprises a curvature calculator for calculating a curvature at each of the vertices (col. 15 lines 33-46).

Cline et al. however do not explicitly teach creating an isosurface of the segmented region of interest. In the same field of endeavor Natarajan discloses a method and apparatus providing topological displays of an internal characteristic of a physical object by creating an isosurface of the segmented region of interest (col. 8 lines 41-59). It would have therefore been obvious to one of ordinary skill in the art to use the teaching

by Natarajan to modify the teaching by Cline et al. for the purpose of accurately determining the topology of the isosurface to maintain topological consistency between the isosurface and the polygonal approximation of the isosurface (col. 5 lines 23-30).

4. Claims 23, 24, 26, 45, 46, 52-57, and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cline et al. in view of King, Jr. 5608849).

Cline et al. disclose a method and system including a computer implemented method for interactively displaying three-dimensional structures comprising the formation of a three-dimensional volume of data from a series of two-dimensional images representing a physical property associated with a three dimensional body (col. 5 lines 1-4), segmenting a region of interest from the volume of data based on selected values of the physical property representing the region of interest (col. 19 lines 33-38), producing a wireframe model of the segmented region of interest, the wireframe model comprising a plurality of vertices with each vertex having a coordinate position (col. 3 lines 15-59). Cline et al. also teach means for refining the wireframe model by adjusting the coordinate positions of the vertices along a normal vector associated with each vertex to more accurately represent the region of interest (col. 5 lines 24-28 lines 56-60, col. 17 lines 10-34, claim 1). Cline et al. further teach rendering the wireframe model in an interactive three-dimensional display, producing a virtual three-dimensional environment (col. 4 lines 60-63).

The reference also teaches grouping or labeling the vertices of the wireframe model into specific regions (col. 8 lines 20-48, col. 11 lines 33-68, col. 14 line 34 – col. 15 line 32). Cline et al. also teach analyzing specific abnormalities or defects (col. 19

lines 45-51) and rendering the wireframe model in an interactive three-dimensional display to indicate the regions having abnormal structure. The eight bit vector is employed to produce vector lists of approximating surfaces. A non-linear interpolation operation is performed to more closely approximate the desired surface and to provide more accurate representations of vectors normal to the desired surface and the accurate representation of these normal directions provides mean for accurately representing shading information on a display screen. The vertex grouper comprises a curvature calculator for calculating a curvature at each of the vertices (col. 15 lines 33-46).

Cline et al. however do not address said method to include guiding biopsy of a tissue inserting a simulated biopsy needle within the lumen. In the same field of endeavor King, Jr. discloses a method and apparatus for guiding the position and orientation of image or a probe such as a biopsy needle in three-dimensional space (col. 4 lines 23-25 lines 66-67), where three-dimensional display could be a wireframe model (col. 5 lines 21-28). It would have therefore been obvious to one of ordinary skill in the art to use the teaching by King, Jr. to modify the teaching by Cline et al. for the purpose of accurately localizing the position of the needle in the spatial coordinate system as it is directed toward a lesion (col. 10 lines 5-9).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BAISAKHI ROY whose telephone number is (571)272-7139. The examiner can normally be reached on M-F (7:30 a.m. - 4p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BR

/Brian L Casler/
Supervisory Patent Examiner, Art Unit 3737